GARDEN AND FOREST.

PUBLISHED WEEKLY BY

THE GARDEN AND FOREST PUBLISHING CO.

OFFICE: TRIBUNE BUILDING, NEW YORK.

Conducted by . . . . . Professor C. S. SARGENT.

ENTERED AS SECOND-CLASS MATTER AT THE POST OFFICE AT NEW YORK, N. Y.

NEW YORK, WEDNESDAY, NOVEMBER 7, 1888.

TABLE OF CONTENTS.

PAGE.

EDITORIAL ARTICLES:—Do Not Spare the Axe.—Piazzas.—Entrance to the Temples at Nikko, Japan (with illustration) 433
The Pines in October ..... *Mrs. Mary Treat.* 435
FOREIGN CORRESPONDENCE:—London Letter ..... *W. Goldring.* 435
NEW OR LITTLE KNOWN PLANTS:—A White-Flowered Cattleya Gigas (with illustration), 436
CULTURAL DEPARTMENT:—The Propagation of Conifers ..... *Jackson Dawson.* 436
The Vegetable Garden ..... *William Falconer.* 438
Roses—Schizostylis coccinea—Helianthus Maximiliani 439
Notes from the Arnold Arboretum ..... *J.* 440
THE FOREST:—The Forest Vegetation of North Mexico. IX ..... *C. G. Pringle.* 441
CORRESPONDENCE:—The Mountain Laurel—Gorse and Scotch Heather in New England—The Destruction of Ants 442
RECENT PUBLICATIONS 443
RECENT PLANT PORTRAITS 443
NOTES 443
ILLUSTRATIONS:—A White-Flowered Cattleya Gigas, Fig. 69 437
Entrance to the Temples at Nikko, Japan 439

Do Not Spare the Axe.

WE have often alluded, in these columns, to the importance of thinning plantations, and more than once called attention to the causes which prevent people, especially those who profess a deep and sincere fondness for trees, from cutting them, when cutting is essential, if the beauty and health of other and more important trees are to be preserved. It is not easy, indeed it is practically impossible, to lay down rules which should govern the thinning of plantations made and maintained for ornament. Thinning is an operation requiring judgment, and judgment in such matters can only come with long experience, and a real knowledge of trees, their characters and requirements. Each case, where it is a question of removing a tree from an ornamental plantation, must be studied on its individual merits, and no rule can be formulated to cover a number of cases. We speak now merely of trees with reference to their effect upon other trees, and not of trees as forming a part or parts of a landscape. The cutting of trees for the purpose of improving a landscape effect or for purposes of mere convenience, as where a tree casts too dense a shade over a dwelling house or other building, presents different problems, which we shall not undertake to consider at this time. What we want to insist upon is, that it is impossible to have fine trees unless light and air and space are provided for them, and that the right amount of these can only be determined by persons familiar with trees and their requirements from the hour of planting. If a number of trees are huddled together no one of them can ever develop into a handsome and symmetrical specimen, and not only are those trees which have been allowed to grow in youth with sufficient space about them the most beautiful, but such trees are the most vigorous in old age and the longest lived. Some trees require more space than others for their best development from an ornamental point of view. Some are most beautiful when they stand entirely alone as isolated specimens; there are others which grow together into harmonious masses of foliage. A Beech is a far more beautiful object when its lower branches sweep the ground, than when it exposes a tall, bare trunk, the result of overcrowding and insufficient light. A White Oak standing alone upon a lawn is valuable in proportion as it has retained its lower branches, and as these rest upon the turf, while the naked trunk of a White Oak in the midst of a large plantation is one of the most beautiful objects which our forests afford. A single White Pine or a group of these trees, without lower branches and with tall and naked shafts, are handsome and natural objects anywhere, while the moment the lower branches of a Spruce or a Fir perish, the beauty of these trees, as ornaments for the lawn, is destroyed forever. No one, therefore, will be able to thin a plantation with real success unless he is familiar with the appearance of the trees with which he is to deal at all stages of their growth and has a clear idea of the effects they are intended to produce as they approach maturity.

There are other cases where cutting down trees requires neither profound knowledge or great judgment, as when a really fine tree—or what might in time, with a little care, develop into a really fine tree—is ruined by the too close proximity of a neighbor possessing neither beauty nor value. How frequent such cases are, any one who looks at trees with the least critical eyes must see. Certainly there are few fine specimen trees to be seen in this country in comparison with the immense number which have been planted during the last fifty years. This is due to the fact that people are unwilling to use the axe. Either they refrain from cutting altogether, or they delay cutting so long, that the damage is done, and the tree which ought to have grown into a noble, widespreading specimen, is left stunted and misshapen. Examples of this neglect of the requirements essential to the growth of a fine tree can be seen on every hand. It is not necessary to look beyond the parks and squares of this city to find abundant evidences that the axe is not often used freely or judiciously. Of the thousands of trees planted on our public grounds, but few have been granted the opportunity for free development, and but few have attained the dignity of stature and expression which they might have reached. The popular clamor is against cutting down a single tree, and year after year starved and often half-dead specimens, destitute themselves of all beauty, present or prospective, are allowed to encroach more and more upon others, which only need a little space and a little light to become objects of the highest civic pride to future generations of New Yorkers.

The lesson which every man who controls trees, whether they be few or many, great or small, should learn, is that whenever he sees a really beautiful, well developed and symmetrical tree, its perfection is due to the fact that it has had, either by accident or by design, sufficient room in which to grow and develop its beauty. This lesson cannot be repeated too often, and until its force is fully appreciated, and until a tree out of place is considered a weed, and destroyed as promptly as other weeds should be destroyed, fine trees will continue to be as rare as they are at present. That they are rare, any of our readers who will examine with critical eyes at this season of the year, when the leaves have fallen, or are falling, their own trees or those which grow upon any public highway or pleasure ground in their neighborhood, will be able to see for themselves. This is the season of the year to study trees with the view of removing all those which are injuring their more valuable neighbors.

Piazzas.

NOTHING is more characteristic of American country houses, as contrasted with those of other northern lands, than their large covered piazzas. These have been developed in answer to as distinct and imperative a national need as ever determined the genesis of an architectural feature. Our early colonial ancestors did without piazzas, for their habits of living and their architectural schemes were alike imported from England and Holland, and amid a strenuous people occupied with sterner problems than how to live most agreeably, it was naturally some time before that gradual modification of habits

which is inevitably brought about at last by new climatic influences, could express itself in architectural language. No colonial house had anything that resembled a piazza. If we find one attached to such a house to-day, it is an addition of later date—as is the case with the well-known Longfellow house in Cambridge.

But the introduction of the classic fashion in architecture meant the erection of porticoes, and the addition which they made to comfort has never again been dispensed with. When classic forms were abandoned in favor of what has been dubbed our "vernacular" style of architecture—when little temples gave way to plain, square, box-like houses with gabled roofs—the portico vanished, but its place was taken by a modification of the veranda which had long been in use in all southern lands. We speak of the course of things in our Northern States; at the South, where Spanish influence was felt, verandas and balconies seem to have been used from the earliest times.

When we say a "vernacular" style of architecture, we mean one which has been the unaffected outcome of universal needs and desires; and, therefore, whatever its defects from an artistic point of view, must have a large measure of practical fitness to recommend it. Many factors of such a style must persevere if progress in art is to mean more beauty and more fitness too; and, in fact, widely as we have departed from the plain, box-like house in recent years, our best new country houses are, in many respects, developed from them, and most notably so as regards the constant presence of the piazza. Considerations of sentiment and art excuse and make good its absence to the owner of an old colonial house; but when a new house is desired it is a clearly recognized necessity, even though some colonial scheme may be closely followed in other respects. Only in very rare cases do we see piazzas dispensed with by an owner who cares more for the odd pleasure of copying with exactness an inappropriate foreign model than for building himself a really comfortable home.

Certainly no really comfortable country home can exist in our land without a piazza. Even on our most northerly borders the heat of our summer atmosphere and the strength of our sunshine make exercise in the open air, to the extent to which it is practiced in England, for example, a sheer impossibility. Nor, for similar reasons, can we sit with comfort on the lawns of England or the uncovered terraces of France, or in the arbors, placed at some distance from the house, which are so characteristic of German villas. We must have a wide and open yet covered space, closely connected with our living rooms, where we can pass our hours of rest and many of our hours of occupation too. How necessary it is we read in the fact that, when well arranged, the piazza always becomes the very focus of domestic life and social intercourse—as central a feature in summer as the parlor fireside is in winter.

But it is hardly needful to-day to affirm that an American country house without a piazza in is in every sense a mistake and a failure—that it palpably lacks fitness and therefore must lack true beauty in the eyes of intelligent observers. It is more needful to protest against the excessive use of piazzas than to urge their erection. When their value was first fully appreciated it was believed that they could not be too freely used. A house of any importance most frequently had three if not all of its sides encircled by them, and their breadth was often as excessive as their length. To-day a reaction has begun to set in, and most fortunately. Piazzas on all sides of a house mean that all the rooms are darkened and that direct sunshine can nowhere enter the lower floor. This consideration is important even when a house is meant merely for summer use; and it is all-important when winter as well as summer comfort must be secured. Again, experience will always show that with very extensive piazzas only certain portions are commonly used, and that other portions might be removed and never missed. And, finally, as one of the most difficult of current architectural problems is so to treat the piazza that it will seem an integral part of the house instead of a mere attached shed, it will be understood that the larger it is, the harder becomes the task. If we look at our best recent houses, we find that the main piazza is confined to one side, or, placed on a corner, partly encircles two sides; and there can be few cases in which more than this is needful.

But for this to suffice the piazza must not be considered as a mere adjunct to an interior which may be planned without regard to it. Success in its arrangement will depend upon choice of exposure and outlook, but also upon the way in which it is connected with the interior. If a piazza does not command the best view or has not sufficient light, or, on the other hand, admits the sun too freely, it will be a perpetual exasperation to its owner; while if it is not easily accessible from the most commonly frequented rooms, it will not fulfill its whole purpose. And, again, a want of thought in placing it may needlessly injure the rooms, excluding light and sun where they are most to be desired. In short, the piazza must be considered from the very outset as an integral portion of the house, and at every step in the planning a careful compromise must be made between its claims and those of the interior. Of course no general rules for its arrangement can be laid down. In some cases there may be but one possible position in which a piazza can exist; in others the advantages of a certain exposure or a particularly charming point of view may be of determining weight; while in others again there will be a much wider latitude for choice. The only rule is to consider all claims together from the very beginning, and to know clearly which ones, by reason of the habits and tastes of the owners, ought to be most fully met, if compromise of any conspicuous kind is necessary. Naturally the claims of the piazza should have more weight when a house is meant only for summer use, than when it will be lived in all the year round.

Entrance to the Temples at Nikko, Japan.

THE illustration on page 439, drawn from a photograph, shows the first or outer gate leading to the memorial temples at Nikko. They were erected in honor of Eyeyasu, the founder of that Tokugawa dynasty, which is more commonly called the dynasty of the "Tykoons," and contain his tomb.

The avenue which leads from Utzunomia to Nikko—a distance of twenty miles—is lined on either side by a double row of tall and stately Cryptomerias. Their branches, joining overhead, form a compact arch over the whole distance, and they have stood for 300 years—since the temples were erected by Eyemitz, the grandson of Eyeyasu. At the end of this avenue, as our picture shows, rises a low terrace, upon which more of the great Conifers stand, forming a superb frame, with their great, furrowed, stately trunks and masses of dark green foliage, for the low but richly colored buildings. The simplicity of the terrace its steps and balustrade, seems excessive, perhaps, to western taste, in view of the rich adornment of the area to which they admit. But it is a good expression of the belief which to a Japanese is one of the first canons of good taste—that simpler things should lead up to more elaborate ones, and that the place where display should not be made is that which is most conspicuously presented to the public eye. From this standpoint the design of the terrace is excellent, and the great stone lanterns at either side of the steps give just the needed decorative accent.

The temples at Nikko are considered the finest in Japan and their site is famous for its natural charms. "He who has not seen Nikko," says a popular aphorism, "does not know how to use the word beautiful."

The Pines in October.

IT is past the middle of October, and several light frosts have cut the more tender herbage, but we still find a good many charming flowers and plants. The Asters and some of the Golden-rods are beautiful now, but the greatest number were in the height of their beauty in September. The New England Aster is still beautiful, and its flowers are more brightly colored in the Pines than in most other localities. Occasionally we meet groups with great masses of rose-colored corymbs, and others of deep violet and purple. This fine Aster takes kindly to cultivation, and graces our garden with its bloom long after Dahlias and other fall flowers are blackened with frost. These garden clumps are from seven to eight feet in height, with many-branched stems, each stem and branch terminated with a dense corymb of bloom. The stems are sufficiently strong to stand erect without stakes. The brilliancy and sweetness of the flowers attract hosts of butterflies, among them the beautiful Painted Lady (*Pyrameis cardui*) and the Red Admiral (*P. Atalanta*).

The Silky Aster (*A. concolor*) is another handsome species, which grows in the more dry barrens. It has slender, wand-like stems from two to three feet in height, which sway gracefully among the grasses, displaying its showy raceme of flowers. The rays are violet-purple, and very numerous, and the stems are crowded with grayish silky leaves. *A. spectabilis* is just now in its prime, and is one of our handsomest Asters. It is a low-growing plant, not more than two feet high, and, when planted about a group of New England Asters, its deep blue rays make a striking picture. Another pretty, low-growing species is *A. nemoralis*. This grows in the damp barrens, and has lilac-purple rays and numerous small leaves with revolute margins Many other species grow here which are worthy of notice and cultivation.

The Golden-rods have been unusually fine this autumn, and some are still in bloom. One of the most beautiful is *Solidago sempervirens*, with smooth, fleshy leaves and spreading panicles of deep golden blossoms. Its habitat is the salt marshes, but it grows here—some twenty-five miles inland—in many places. No doubt the seed has been brought in salt hay, which is fed to stock and often used for mulching. *S. elliptica* is another beautiful species growing in the damp barrens, now brilliant with bloom. The leaves are smooth and shining, and the flowers are in dense, spreading racemes. Numerous other species grace the roadsides and neglected fields, here as elsewhere, making the "closing out" the most splendid display of the year.

The large Bur-Marigold (*Bidens chrysanthemoides*) is still in bloom among the Sedges in the wet barrens. It is showy and handsome, the deep golden-yellow rays being an inch or more in length. Near by, the pretty Ladies' Tresses (*Spiranthes cernua*) are scattered among the grasses. This little Orchid has pure white, waxy flowers spirally twisted around the stem, and deliciously fragrant. *S. graminea* and *S. gracilis* are also here, each with their several varieties. The species seem to run together, and are a puzzling group to the botanist. Possibly this mixing is due to the work of insects which visit the flowers, and carry the pollen masses to other plants, fertilizing one species with another.

The False Rocket (*Cleome pungens*) is established among our native plants. A stout, much-branched specimen, with long spikes of handsome purple flowers, was growing where white sand had drifted around it. It was much more vigorous than some others found in damp soil. The leaves and stems had lost none of their mephitic odor in this poor soil, and therefore it was not a desirable addition to our wild bouquet. The Swamp Maples and Sour Gum or Tupelo, and the Liquidambar, or Sweet Gum, together with the lower-growing trees and shrubs, have a brilliancy of color which cannot be excelled in any part of our country; but, unfortunately, we lack the roll of hill and valley, the foundation of cliff and mountain-side for the proper display of this grand picture.

Many trees and shrubs are now beautiful with their ripening fruits. The dark foliage of the Hollies is in fine contrast with its scarlet fruit. The Black Alder (*Ilex verticillata*) is conspicuous with its deep red, clustered fruit, and the fragrant Wax Myrtle (*Myrica cerifera*) is full of its grayish, waxy berries. Inkberry and Sumach, Ampelopsis and Smilax, all help, with fruits of varied form and color, the beauty of the dying leaves, and make our woods and fields more beautiful, if possible, in October, than they have been at any other season of the year.

Vineland, N. J. *Mary Treat.*

Foreign Correspondence.

London Letter.

TO-DAY'S meeting of the Royal Horticultural Society was in strong contrast to that a fortnight ago, when the hall glowed with the colors of a thousand Dahlias. The hall was very dull, a sharp frost a week ago having promptly put an end to the Dahlia season once more. The reign of the Dahlia continued but three weeks this year, and if all our seasons were so cold, sunless and rainy as the present we should abandon the cultivation of this flower altogether. The great feature of the meeting to-day was a marvelous exhibition of Ferns, chiefly stove and green-house kinds, sent by Mr. H. B. May, of Edmonton, one of the chief Fern-growers for Covent Garden market. The collection numbered hundreds of plants, representing the very finest Ferns in cultivation, and included not only such kinds as are grown specially for market, but a host of others, many of them rare, that could not be seen elsewhere than in the largest collections. Mr. May has for years devoted himself specially to these plants, and has succeeded in raising many varieties of the highest excellence, among them being such beautiful kinds as *Adiantum Reginæ, Pteris Cretica Mayi, P. serrulata cristata compacta, P. tremula flaccida, P. tremula elegans, P. tremula grandiceps*, all of which he grows largely for market, and which, no doubt, are known now in American gardens. The five named first have received the highest awards of merit from the Society. Passing over a crowd of species and varieties that would be uninteresting to the general cultivator, I was anxious to know the kinds Mr. May grows most extensively for Covent Garden, and as these may be useful to some readers, I append the list. For cutting—that is, for cut fronds gathered in convenient sized bunches—the following are most largely used: *Adiantum cuneatum*, the common Maidenhair Fern grown by thousands; *A. Williamsi*, with the fronds powdered with gold; *A. elegans*, a form of *A. cuneatum*, with longer and larger fronds and smaller pinnæ. The list of the kinds grown for sale in pots includes, besides the foregoing, *A. scutum; A. Reginæ*, very dwarf, with young fronds coppery red; *Pteris Cretica albo-lineata, P. Cretica Mayi, P. serrulata major*, a robust growing variety; *P. serrulata cristata compacta; P. argyræa*, with silvery marked fronds; *P. tremula*, and its several varieties, all favorites in the market; *Cyrtomium falcatum*, capital as a room Fern, as it withstands dust so well; *Phlebodium aureum, Lomaria gibba* (when small), *Doryopteris palmata, Onychium Japonicum* (also for cutting) and *Asplenium bulbiferum* (and its varieties), which is the most useful of all the Asplenium for market. These comprise most of the kinds grown specially for Covent Garden, and this list has been compiled from years of experience, and is rarely added to, as few new Ferns possess the requisite qualities for market, which, first of all, must be elegant, then robust and easily and quickly grown into plants of salable size, and, moreover, must be easily propagated. They must also "carry" well—that is, they must not be liable to injury from rough usage in getting them to the market and by the treatment they receive there.

Among the few plants and flowers which won first-class certificates was one Orchid, the beautiful little *Cattleya porphyriles*, supposed to be a natural hybrid, but between which species I cannot say. It is a small grower, with slender pseudo-bulbs from six to eight inches high, carrying a pair of leaves. The flowers are about four inches across, with rather narrow, purplish rose sepals and a beautifully formed lip with rounded lobe of an intense maroon crimson. It is an exquisite little Orchid, and Baron Schroeder, who exhibited it, prizes it highly. Messrs. Veitch, of Chelsea, showed, in their choice group, a new hybrid Pitcher Plant named *Nepenthes Dicksoniana*, in honor of the late Professor Dickson, of the Edinburgh Botanic Garden. It is a cross between *N. Veitchii*, which has large, handsomely-shaped pitchers with broad grooved rims, and, in color, a pale green, and *N. Rafflesiana*, the well-known species, with its large pitchers boldly blotched with blood-red on a green ground. The hybrid partakes of the characters of both parents, but is handsomer in shape than either, as large as *N. Veitchii*, and more beautifully marked than any form of *N. Rafflesiana*. It is, moreover, a very strong grower, as most hybrid Nepenthes are, and forms pitchers freely, which is a great recommendation. A new Maidenhair Fern named *Adiantum Waltoni diffusum*, was worthily certificated, as it is a most elegant Fern and a robust grower. The original *A. Waltoni* reminds one of a tall growing form of *A. cuneatum*, with small, deeply cut pinnæ. The variety Diffusum differs in its larger fronds and more spreading habit. Both this and the type originated with Mr. Walton.

An early Chrysanthemum named Elsie was exhibited by the well-known grower, Mr. Stevens, of Putney. It is a large flower with narrow, reflexed florets, very full and of a delicate straw color (some call it primrose), just such a tint as every one admires. The certificate was voted unanimously, a good criterion of its merit. Another new Canna, so bold and handsome in foliage, so brilliant in flower, that it quite captivated many of the committee, also won a certificate, but it was not so fine as some that Messrs. Cannell have shown previously. Its name is Ulrich Brunner, and it has brilliant scarlet flowers with green foliage. It was shown by Messrs. Veitch. A group of double flowered Begonias from Messrs. Cannell was next passed upon, and two were singled out as worthy of certificates. One was Mrs. Stuart, with flowers of a rich, clear yellow; the other General Chubet, of a beautiful rose cherry. Both have a dwarf, sturdy growth, the blossoms being of enormous size, very double, and resembling double Hollyhocks more than Begonias.

The other exhibits worthy of notice included a new Rose all the way from Elsinore, in Denmark. The blooms were much damaged, and several were of the opinion that the variety was identical with La France; but as the blooms came through Mr. W. Paul, of Waltham Cross, who, of course, knows Roses as well as any one, the committee reserved their opinion until they see good blooms early in the season next year. It was named Hybrid Perpetual Denmark. Messrs. Veitch had in their group some noteworthy plants, such as a basketful of admirably grown and flowered specimens of Bouvardia President Cleveland, which is considered to be the finest of all the scarlet single Bouvardias. Its color is very brilliant, and the flowers and trusses are both large. The same firm also showed *Amasonia calycina* (*A. punicea*), a new stove plant with scarlet bracts, and long, pale yellow flowers that are produced in continuous succession for several weeks in autumn and winter; Amaryllis Autumn Beauty, a hybrid from *A. reticulata*, with large, pink flowers always produced in autumn when no other Amaryllis is in bloom, and Begonia John Heal, a charming little winter flowering Begonia, obtained by crossing *B. Socotrana* and *B. insignis*. It produces an abundance of rosy carmine flowers, which, in contrast to the large, pale green foliage, is very beautiful. It is justly looked upon as a first-rate winter flowering plant.

Baron Schroeder's gardener, Mr. Ballantine, showed cut blooms of two choice Orchids, *Lælia Dominiana* and *Lælia Novelty*. The first is a cross between *Cattleya Dowiana* and *C. Exoniensis*, and it is strange that this mingling of two Cattleyas should make the hybrid a Lælia, but so it is. It has the large, bold flowers of *C. Dowiana*, lilac-rose sepals, and a broad lip of the richest crimson purple, not a trace of the characteristic golden tint of *C. Dowiana* being present. This is one of the rarest of all hybrid Orchids, and very few plants of it are in existence. *C. Novelty* is a hybrid between *Cattleya marginata* and *L. elegans*. It is a good deal like *C. porphyriles*, but the tube of the lip is pure white, which is a strong contrast to the crimson lobe. Some plants of *Adiantum Farleyense*, said to have been raised from spores, were shown by Mr. Goldby, of Brierfield, who states that he sowed the spores on February 23d last year, and the sporlings appeared soon after. If this statement is correct, it tends to disprove the theory that this beautiful Maidenhair Fern is a hybrid, and never produces fertile spores.

London, October 9th. *W. Goldring.*

New or Little Known Plants.

A White-Flowered Cattleya Gigas.

THIS very interesting novelty, of which an illustration of the only plant now known appears upon page 437 of the present issue, was collected by Mr. Francisco Timanotiny for Messrs. Siebrecht & Wadley, in Medellen, United States of Colombia, during the autumn of 1885, and has been successfully flowered by them during the past summer in their Orchid establishment at New Rochelle, near this city. The sepals and petals of the flower are pure white, while the large, full lip is white, delicately shaded with rose, but preserving the two faint yellow eyes characteristic of the species, from which this variety does not otherwise differ.

The plant has been added to Mr. F. L. Ames' rich collection of Orchids, where it is now making a vigorous and satisfactory growth.

Cultural Department.

The Propagation of Conifers.

MANY propagators of Conifers put in cuttings and do their grafting between early August and October, but while some succeed, many more fail. My experience is that the very changeable weather of our late summer and early autumn renders this work most difficult then, because greater attention is needed to keep the degree of temperature and moisture uniform than it is later in the season. Many Conifers, it is true, will root at any season, but it is nearly impossible to persuade others to root during the hot weather. In the winter season the plants seem to have stored up all the material ready for use in making a new growth, so that they are in better condition to form callus and roots than at any other time. There is also less evaporation under glass in winter than there is in hot weather, and by artificial means we can control the conditions of heat and moisture more easily. In fact, the more steady the cold weather in winter, the better is the chance of success in propagating hard-wood plants.

A green-house is essential for the propagation of evergreens in winter as far north as Boston. The cuttings can be put in an ordinary propagating bed, in pots or in boxes. For large lots, I prefer shallow boxes, and for smaller quantities pots are chosen, since they can be more conveniently removed without disturbing the roots. In any case, good drainage must be secured with potsherds or coarse gravel covered with moss or peat to keep the sand from sifting through. The cuttings should be collected, if possible, on mild days, and when not frozen. If not used at once, they can be kept in damp moss, in a cool place, for a week or more without injury. If the cuttings must be gathered in freezing weather they should be buried in damp moss for several hours before they are used. The cutting should be made with a heel, using a sharp knife, and it should be from two to four inches long in most Evergreens. As soon as made, the cut-

tings should be put in so closely as to touch each other, and a good watering should be given to settle the sand well around them. They should then be placed on benches in a cool house, where the temperature does not rise above 45° at night, or ten to fifteen degrees higher during the day. In sunny weather a slight syringing once or twice a day will be needful, and they should be shaded if necessary. They should be kept at this low temperature for one or two months, or until well calloused, when the temperature can be increased by 10°, and if a slight bottom heat can then be given it will hasten the rooting. About the middle of April they will, in most cases, be well rooted, and as soon as the weather is settled they can be hardened off in frames with a slight protection, and if planted out in frames by the middle of May, they will be established by autumn, and will need no protection until the ground begins to freeze. Choice varieties, as soon as they are rooted, should be transplanted into boxes of light soil, and grown during the summer under glass. They should be wintered in cold pits, and transplanted into beds the following spring. Among the Conifers I have successfully treated in this way are *Thuya occidentalis* and its varieties, *Chamæcyparis* (*Retinospora*) *obtusa*, *C. pisifera*, *C. plumosa* and and its varieties. Such Junipers as the Irish, Swedish, Douglas' Golden and other varieties of common Juniper, *J. Japonica* and some varieties of *J. Virginiana; Picea nigra pumila*, *P. excelsa Gregoriana*, *P. pungens*, *P. Omorika* and *Abies concolor*.

I find the best time to put in cuttings of most evergreens is from the middle of November to the middle of January. I have tried several hundred cuttings of *Picea pungens*, giving them every possible care, and yet lost all but two in a hundred of them, while of those put in in January I have saved fully one-half. In taking cuttings of Picea I find the smallest wood the best. I have not been successful in propagating varieties of the common Hemlock from cuttings, although cuttings of Japanese Hemlock (*Tsuga Sieboldii*) root well. The Ginkgo roots readily from hard or soft cuttings.

Sciadopytis also roots well, though slowly. All varieties of the Box can be treated in the same way as Conifers. *Ilex glabra* and *I. Aquifolium* root well from cuttings of the current year's growth, and the former can be put in at any time from November till February; but *I. opaca* should be put in early in November and kept in a close frame until well calloused, which requires from two to three months. Cuttings should be taken from a fruiting plant if the berries are an object, and the same can be said of all plants of the Holly family.

While most Conifers, except Pines, can be propagated reasonably well from cuttings, stronger plants can be obtained by grafting, but many gardeners who do not hesitate to graft the most tender plants seem afraid to make the trial with Conifers. With few exceptions they are easier to graft than many hard-wood plants, although more time is required to complete the union. In grafting, the first consideration is the proper selection and preparation of stocks. These should be potted, if possible, in spring, and plunged in a sheltered situation where they can be watered during the summer; and at the approach of freezing weather, they should be put in a cool cellar or pit where they can be kept until needed. They should be taken into the house two or three weeks before the time of grafting, so that the sap may be well started. Where the stocks have not been prepared in spring they can be potted in October or November and put in a cool green-house, where they should be syringed daily in fine weather and kept in a temperature of not less than 50° at night, with a little bottom heat, if possible. As soon as the new roots reach the side of the pots the grafting may begin.

But besides having the stocks in good condition, it is a matter of importance to know what kinds to select for the different species and varieties. For all Firs, seedlings of *Abies pectinata* or *A. balsamea* make the best stocks. For the Spruces, the Norway is the best and most easily obtained, although the White Spruce makes good stocks. It is, however, more difficult to procure. The common Hemlock

Fig. 69.—A White-flowered Cattleya Gigas.—See page 436.

is the best stock for *Tsuga Sieboldii* and for varieties of *T. Canadensis*. For the Retinosporas, Lawson's Cypress and other species of Chamæcyparis, together with *Libocedrus decurrens*, the common Arbor Vitæ, and the White Swamp Cedar, make good stocks, but plants of this class do better on stocks of the common form of *Chamæcyparis pisifera*. This last roots readily from cuttings and makes good stock in two years. The common Red Cedar is the proper stock for all species and varieties of the Juniper except *J. occidentalis*. I find no better stocks than White Pine for all Pines of the five-leaved section, while for the two-leaved Pines, the Scotch Pine is generally used, although the Red Pine would be better if it could be easily procured. Some three-leaved Pines, like *P. rigida*, *P. Tæda* and *P. ponderosa*, do quite as well, so far as I have observed, on this same stock. Varieties of the common and Japanese Yews graft well on seedlings of the common Yew. Thuyas do well when grafted on stock of common Arbor Vitæ. The Western Larch, the Japanese Larch and varieties of the European Larch graft readily on this species, but I have not been successful with *Pseudolarix Kæmpferi* on the same stock, nor on *Larix leptolepis*. Sometimes it will make good growths for a year, but, with me, it gradually dies out.

I usually begin to graft Conifers late in December, and can graft with success, if need be, until the first of March. After that time they are more difficult to manage. The very best results are secured from December to February. The mode of grafting depends much upon the time of year and other conditions, but I have found the simplest method the best, although other ways may be tried for experiment's sake. The side or veneer method is most easily learned, and has this advantage over cleft grafting—namely, that if the graft does not take at the first operation, the stock is not destroyed for the season, but the operation can be repeated on another side or a little lower down. In making this graft a smooth place should be selected on the stock, and a slight downward cut should be made with a thin-bladed knife a few inches from the base of the plant, cutting entirely through the bark, but, if possible, not into the wood. Then the blade is inserted two or three inches above, cutting a thin slice off the bark down to the cross cut below. A similar slice is cut from the scion and the end of the scion is cut with a slight angle on the opposite side to fit into the lip of the stock. The two are then closed together, care being taken that the cambium layers come in contact with each other. They should then be bound firmly with strands of bass ruffa, or other soft tying material. The grafted plants are then laid on their sides in a close frame which has been previously prepared by putting in a few inches of sand or moss. No wax is needed at this season. For the first few weeks the frames must be kept close, and the plants need a slight daily syringing in fine weather. When they show signs of knitting together, which will be usually in two or three weeks, a little air may be given, and after the house is closed, the sashes may be raised for several hours, and finally air may be given them all night. The grafts will need looking over occasionally to see that no ties are cutting through the stock or scion. If they are, loosen and retie. Union will be effected easily in from five to eight weeks, although in some species a longer time is needed. As soon as the grafts are established they should be taken from the frames; and the tops of the stocks should be shortened. They should be set on benches in the green-house and treated as other plants. Do not cut the stock back closely until the following spring; this is especially necessary in the case of Pines and Spruces; many plants are lost by heading back too early. As soon as the weather is settled in May, the plants can be taken from the green-house and plunged in beds. If the roots are matted they should be carefully separated and spread out, for when once the roots of Conifers are pot-bound, unless they are separated, they will continue growing in a contracted way, and many valuable trees have been lost from this cause. When evergreens have been grafted and laid on their sides in damp sphagnum, and covered several inches, they require much less care, and a few moments' neglect will not be felt as it would otherwise. A few years ago, for experiment's sake, I grafted 100 stocks of *Picea pungens* and laid them on a side bench which was covered with six inches of sphagnum. I then covered the grafted plants about one-third of the way up. These were syringed lightly once or twice a day in sunny weather, and the temperature of the house was kept at about 50° at night, the moss being on a slate bench over the pipes which were kept at an even temperature of 65°. The result was ninety-two strong plants without the aid of a double frame. Some nurserymen seeing the experiment have tried the same with equal success. I was first led to this method by accident. I had a corner filled with moss, and late one evening buried a few plants that had been grafted. Then I forgot them until I had occasion to remove the moss, and found that the plants had taken well. This led to further trial, which has proved of considerable value to me.

Arnold Arboretum. *Jackson Dawson.*

The Vegetable Garden.

ALL tender crops, as Snap and Lima Beans, Egg Plants, Peppers and the like, have been destroyed by frost, and are now cleared away and the ground they occupied manured and dug. But many crops are not yet gathered, and it often is inconvenient to manure and dig a piece of ground lately occupied by a tender crop—like melons, for example—till the hardier crops, as Parsnips, growing in contiguous plats, are also removed. Asparagus tops have been cut, cleared away and burned, and we are now manuring and digging the ground. We plant our Asparagus deep enough to allow us to plow or dig over the crowns without touching them. The stumps of the stems which are left in the ground cannot now be removed, but in April and before Asparagus cutting begins they can be pulled out with the greatest ease. Were they left in the ground in spring they would be in the way of the knife used in cutting the crop for use. Asparagus can be planted now as well as in spring, on the level and only a few inches deep; but if planted in trenches eighteen inches deep, as the large market growers do, then planting had better be deferred till early spring.

It is now time to attend to the lifting, topping and storing for winter of the root crops. Pull up the Beets, and save the nice, well shaped, tender ones. Large, coarse, old roots are not worth saving for culinary use. In cutting off the leaves do not cut quite close to the bulb, else it will bleed, and never cut off the end or tap root. Lay them on the ground in heaps of one or a few barrelfuls, and cover them with tops or straw enough to exclude frost, with a shutter over that to protect them from rain, and leave them here for a week or ten days to sweat. Then bring them into the pit, cellar or other winter quarters; do not store them for the winter in large bulk, else they will rot. In order to keep them plump and fresh pack them in open, narrow, well ventilated bins in the vegetable house, and use a good deal of ordinarily moist sandy soil thrown in among them. Treat Carrots in the same way, only the leaves can be cut close to the roots and they may be stored in large bulk if desired. Although Carrots keep fresher when packed in sand or earth, this is not at all necessary. Parsnips may be treated as Carrots. But as Parsnips lose much of their flavor when kept out of the earth, we pack them in sandy soil and in this way retain their good taste. Salsify, Scorzonera and Skirret should be treated like Beets. Do not crop them close. Treat Turnips in about the same way as Carrots. Much difficulty is often experienced in keeping Jerusalem Artichokes from rotting in winter, but with proper care they keep very well. The tubers mature slowly and should not be lifted till late in the season. Then store them on the ground in very small bulk, covering them with some straw and a little earth, or a shutter over the straw to keep the tubers dry. At the end of a week or two store them in the root-house in small bins and with plenty of earth or sand among them. Horseradish is another root that should now be lifted and stored in sand or earth. If not kept in this way it wilts and loses much of its pungency. In preparing it for storing, cut off the tops, also the thong roots, which are not large enough for culinary purposes, and save enough of these long, straight, fleshy roots for sets for next year. Instead of having sets two or three inches long, have them eight or ten inches long.

In lifting and storing root crops, be particular not to remove them at once into their winter quarters unless they are exceptionally congenial. Never store away roots that are wet or in any way decayed. See that the root-house is dry overhead and at the bottom, that it is moderately dark and well ventilated, and that it can be kept uniformly cool, say about 34° to 40°. Never store roots of any kind in large bulk.

Turnips, Carrots and Potatoes, of which we usually have the largest bulk, may be successfully wintered in out-door pits. We always store hundreds of barrels of Carrots in this way: the pits are five feet wide, six inches deep and of a length to contain the crop. The Carrots are heaped up three feet high along the middle. Some thatch is spread over the roots, then a coating, some eight to twelve inches thick, of earth, is placed over the straw. Drain tiles, as ventilators, rise from the roof of these pits every five feet.

It is not well to lift root crops, except Potatoes, before sharp frost occurs, and even then we should not cover them up

thickly till near the time when settled wintry weather sets in.

Many root crops—Parsnips, Salsify, Scorzonera, Artichokes and Horseradish, for example—are perfectly hardy with us, and keep better and retain their quality better when left in the ground and lifted and used as required. But this is impracticable. We may leave a part of each crop in the ground till early spring, if so desired, but as it is advisable to have the ground completely cleared of summer crops, manured and plowed or dug in fall, this work could not well be done if some of each kind of roots were left growing in the ground till spring.

Roots of Sea Kale, Dandelions, Sorrel and Chicory, for winter forcing, should be lifted now and stored in sand in the root house for use as desired. In topping them, we are careful never to cut into the crown, as it is the leaf and not the root that is used. As the winter advances we keep up a succession of these vegetables, planting the roots thickly in soap boxes placed in the Mushroom house or other quarters, where a temperature of 60° or over is maintained. And when they start to grow, in order to have the tops well bleached and tender, we invert other boxes over those in which the roots are growing.

William Falconer.

Glen Cove, N. Y.

Entrance to the Temples at Nikko, Japan.—See page 434.

Roses.—A close watch should be kept at this time of the year for the first appearance of red spider on the Roses, because, when taken in time, the spider may be exterminated before much injury has been done. Unless very carefully fired during the changeable weather of the autumn, the houses on some occasions may get too warm at night, and when this occurs the foliage of the Roses becomes weakened and an easy prey to the spider. Thorough syringing, with a good pressure of water, is the most effectual method of dealing with red spider, and by using a good head of water the stream can be used to much greater advantage on the foliage without giving an undue amount at the root, which latter condition should be avoided at all times during the winter, and especially with Papa Gontier and Niphetos. Both of these Roses are very susceptible to excessive watering, and will soon show its effects by an unhealthy appearance and the loss of a large portion of their foliage.

Another trouble the Rose-grower has to contend with at this season, or has to contend with to a greater extent at this season than during the summer months, is the disease known as "black spot," or "black mildew," an insidious and most persistent enemy to healthy Rose growth, and though well known in appearance, Rose-growers seem unable to entirely prevent its ravages, especially among the Hybrid Teas. Various modes of treatment have been adopted for the purpose of preventing or curing "black spot," and with various degrees of success, the most approved method at present being that of keeping the affected plants rather dry at the root, and at the same time giving them a slight increase in temperature. This seems a reasonable treatment, from the fact that the spot almost invariably follows excessive watering, when the latter is coupled with a close, moist atmosphere. It is also well to remove the affected leaves as much as is possible without actually stripping the plants, as it is most likely that the growth of the fungus is encouraged and spread about by the decayed leaves falling on the ground. In fact, cleanliness will be found to pay in the Rose-house at all times of the year. This disease has given most trouble among the Hybrid Tea Roses, such as La France, Bennett, American Beauty, and others of similar character, and from the preference it has shown for this class of Roses, it would seem as if there was some special defect in their constitution, which laid them open to its attacks. Either this is true or else the prevalent mode of growing them is defective. Possibly the deciduous habit of the Hybrid Perpetuals may have something to do with the peculiarities of the Hybrid Teas, though the latter class is usually understood to do better when treated

as Teas, than when grown by the methods adapted to Hybrid Perpetuals. *W.*

Philadelphia, Pa.

Schizostylis coccinea.—We are now enjoying the flowers of this beautiful South African plant. It belongs to the Iris family, and is commonly known as Crimson Flag or Kaffir Lily. It always blooms in fall, especially from October till December. During the winter months it requires the protection of a cool green-house or warm frame, but throughout the summer months out-door treatment. Rich, moist soil and a sheltered, slightly shaded place suits it best, and it may be grown in pots or planted out in summer, and lifted and potted in September. In order to have it in its greatest luxuriance, however, it should be planted out permanently in a frame from which frost is excluded at all times. The flowers are crimson, one and a half to two inches across, and closely arranged on spikes after the fashion of some Gladioli. Propagation is easily effected by means of division in spring or early summer.

Helianthus Maximiliani.—This is the finest hardy perennial Sunflower now in bloom. It grows from seven to ten feet high, and just now (in late October) its long, wand-like stems are terminated for two to three feet of their length with bright golden-yellow flowers closely set to the stems. The whole plant is rough-hispid; the leaves are alternate, scabrous, lanceolate, acute. The species is indigenous to the "Prairies and plains west of the Mississippi, and from the Saskatchewan to Texas." It spreads a good deal at the root, but not nearly to the extent that most other perennial species do. There is a current idea that it is not quite hardy, but we have never known it to show any signs of being tender. We find that growing it for several successive years in one place in the garden debilitates it, no matter how much manure we give it. It should be transplanted to fresh ground every second or third year if it is to continue at its best estate.

G. C.

Notes From the Arnold Arboretum.

A SEVERE and sudden frost in the middle of September, following six weeks in which the rainfall was almost without a parallel in amount in eastern New England, and during which the sun was rarely seen, destroyed the foliage on many plants, and has greatly impaired the beauty of many others, which, ordinarily, at this season of the year, are more beautiful than at any other. Fruits, too, have ripened badly, and many shrubs, native and foreign, are almost destitute of berries, which are often more attractive than the flowers preceding them. It is probable, moreover, that the damage inflicted by the unusual wetness of the season will not be fully felt until next year. Unripened wood, and the wood of comparatively few plants is thoroughly ripened, means that many plants will be killed back during the winter, and that those which bloom upon this year's growth, even if it is not killed, will not produce many flowers next spring and summer. Plants, therefore, of doubtful hardiness, should be protected this winter with unusual care; and even those which have shown themselves perfectly hardy for years will be all the better for a little protection during the cold weather, in view of the unusual climatic conditions of the past season. There are some plants in the collection, however, which are very beautiful now, and it is perhaps well to mention them, for if a plant assumes a brilliant autumn coloring this year, it may be depended upon to do so under the most unfavorable conditions.

The foliage of the common Barberry (*B. vulgaris*), of European origin, loses its leaves late, and after a very slight change of color. This plant, naturalized in North America, has not changed its character in this particular with its change of home, and in New England still lacks autumnal brilliancy of leaf. But the common Barberry is a plant of wide geographical distribution. There are growing in the Arboretum specimens of Manchurian and of Japanese origin. The former, which in some gardens is known as *B. Amurensis*, is now bright with orange and scarlet, while the Japanese plant is still more brilliant and more beautiful. The fruit of this last is smaller, and borne in shorter racemes than upon the European plants. For its foliage, if for no other reason, the Japanese Barberry should be better known in our gardens. Still more brilliant is the autumn coloring of *Berberis emarginata*, a Siberian plant, closely related to the common Barberry, and perhaps to be considered as a mere geographical variety of it. This is certainly one of the most desirable of shrubs, considered with reference to the autumnal coloring of the foliage. *Berberis Thunbergii* is very beautiful, however, at this season of the year, and the large and conspicuous fruit, solitary, or more rarely umbellate, remains unshriveled upon the branches until the appearance of the new leaves in spring. The growing popularity of this plant is certainly well merited. *Berberis Chinensis*, the most graceful of all the Barberries in this collection, is still perfectly green. Later it will be clothed in brilliant hues. There is a difference, however, in the autumn coloring of different individuals of this group, the plants which originated in the mountains of northern China being the most valuable in this respect. The fruit of this species is unsurpassed in size and brilliancy of coloring and in the length of the long, graceful racemes, which now fairly weigh down the slender, pendulous branches. The pretty little Himalayan *Berberis concinna* has turned brilliantly, too, to orange and scarlet, and so has our only eastern American representative of the genus, *Berberis Canadensis*, a rather rare Alleghany plant.

Many of the North American *Ericaceæ* are now striking and beautiful objects. None are more beautiful than the common high-bush Blueberry, *Vaccinium corymbosum*, which, when well grown, is sometimes eight or ten feet high, and a stout, thick, wide spreading bush. It is impossible to describe the splendor of the scarlets with which, at this time, its leaves are tinged. They are fairly dazzling. This plant is beautiful when in flower; its fruit is handsome, abundant and of excellent quality, and among North American shrubs there is none more brilliant in late October. It is easily transplanted from its native swamps and hillsides to the garden, where it thrives in good soil and grows with more rapidity than most plants of its class. More than other Blueberries, too, it shows a tendency to vary in the size, shape and quality of its fruit. Any attempt to improve the Blueberry by selection, with the view of adding it to the list of cultivated fruits, should naturally begin with this species. Simply as an ornamental garden plant, it deserves a place in every garden, and it is surprising that gardeners have so long and so generally neglected it. Two Huckleberries, *Gaylussacia frondosa* and *G. dumosa*, are very brilliant just now, and, like all the *Vaccinieæ*, should find a place in gardens where attention is paid to planting for autumn effects of color. And very brilliant, too, is the Sourwood, *Oxydendrum arboreum*, which is hardly surpassed in color at this season of the year by any American tree. Here it is scarcely more than a tall bush, but in the forests, which cover the sides of the southern Alleghanies, it becomes a fair-sized tree, rivaling the Flowering Dogwood and the Tupelo in its scarlet leaves, the effect of which is increased by the long compound racemes of yellow fruit hanging from the extremities of all the branches. This tree is often planted and greatly esteemed in Europe, where it has been known for a century at least. Here it is little known by gardeners and rarely seen in gardens.

The leaves of *Rhododendron Vaseyi*, recently figured in this journal, have now turned to a deep, dark crimson, a character which will increase the value of this beautiful and interesting addition to our garden flora. The wood, in spite of the wet season, seems thoroughly ripened, and the plants are well set with flower buds.

Cornus florida has, as usual, turned to a deep, rich scarlet, and *Cornus sanguinea* is hardly less attractive, with its broad leaves now the so-called old gold color, with the margins of a deep scarlet. The habit of this plant is exceptionally good when it is given room for the free development of all its spreading branches; and the bright color of its bark makes it an agreeable object in winter after the leaves have fallen.

Viburnum acerifolium, one of the commonest of the native species in hilly and in northern regions, shows some pink in the prevailing scarlet of the autumn tints of its leaves, which are not surpassed in brilliancy by those of any other Viburnum. This plant has a neat and compact habit of growth and handsome black fruit, which make a pleasant contrast with the foliage. The foliage of *Viburnum pubescens*, which is another rather small growing native species, worthy of a place in every garden, turns to a deep and very rich dark purple, which is quite unlike that of any other shrub in the collection. It contrasts admirably with some of the species, like the last, with brighter foliage.

The Witch Hazel, the latest of all our shrubs to flower, is now in full bloom, the pretty yellow flowers being partly hidden by the ample leaves, which have turned to orange, and will fall before the petals. This autumn color of the leaves of this American plant does not appear in those of its Japanese congener (*Hamamelis Japonica*), which shrivel and fall while still green. *Fothergilla alnifolia* has brilliant golden leaves just now, while those of the Japanese *Photinia villosa*, figured in an early issue of this journal, are now of a brilliant scarlet. A better acquaintance only confirms the value of this plant for garden decoration.

Some plants are valuable because their foliage is able to resist frost, and to keep green and bright very late in the autumn. The common Barberry is a conspicuous example of this sort; others are *Akebia quinata*, a handsome Japanese climbing plant, related to the Barberries, and the well-known Japan Honeysuckle. The leaves of most of the Japanese plants in cultivation turn in the autumn to the same colors which their American congeners assume, but in the case of these two plants, both of which, in more temperate climates, retain their foliage until spring, the leaves remain green until killed by severe freezing; and this is true of nearly all European shrubs and of most European trees, *Acer platanoides*, the Norway Maple, being the only one of the common European trees which assumes here anything like brilliant autumn tints of color.

Few shrubs are in flower. Flowers may still be found, however, in considerable profusion upon *Daphne Cneorum*, a plant which remains in bloom almost continuously during the season. Few shrubs produce more attractive or more fragrant flowers, and were it only a little more hardy and a little less slow to propagate, this Daphne would be one of the most desirable of all low under-shrubs for the garden-border or for the rockery.

The Japanese Honeysuckle, or that variety which is very generally known in American gardens as *Lonicera Hallii*, is still sparingly covered with its deliciously fragrant white flowers, which turn yellow in fading, and which nothing but the most severe freezing ever entirely destroys.

The latest growths of the Texan *Clematis coccinea* are still covered with the bright and handsome scarlet, bell-shaped flowers, peculiar to this species—a remarkable fact in the case of a plant of such southern origin, which would hardly be expected to be hardy in the New England climate. The capacity to bloom late adds very considerably to the really great ornamental value of this pretty plant.

Flowers may be found still upon the Japanese Rose (*Rosa rugosa*), especially upon plants of the white-flowered variety; but this, perhaps, is accidental. This fact, too, increases the value of this plant, which seems to possess all the qualities which make a plant valuable in ornamental gardening. It is hardy, and it grows rapidly; the handsome and fragrant flowers, varying on different individuals from deep dark red to the purest white, are produced almost continuously from early spring to late autumn. The foliage is unequaled among Roses in luxuriance and in the depth and brilliancy of its dark green, which in autumn turns to intense shades of crimson and orange. The large and abundant fruit is not less showy than the flowers, while, more than all other Roses, it is free from the attacks of injurious insects. Care must be taken, however, to select plants of good varieties. Very inferior ones are often sold in nurseries, hybrids probably of this species and *Rosa cinamomea*, which are not worth planting.

There is a variety with double or semi-double flowers, which shows traces of the blood of some other species, but it is not worth a place in the garden. The best of a large number of varieties in this collection are one with very dark red, single flowers, a seedling raised by Mr. Dawson, and the pure white single-flowered variety. *J.*

October 21st.

The Forest.

The Forest Vegetation of North Mexico.—IX.

Juniperus pachyphlœa, Torr., one of the noblest of American Junipers, not rarely attaining a diameter of three or four feet, and a height of fifty, admirable for its symmetrical and compact habit and large reddish brown fruits, ranging through the mountains of southern Arizona, New Mexico and Texas, is at home on all the ranges about the divide and throughout the Cordilleras forest as far south, probably, as the state of Jalisco. From the cañons of the mountains about Chihuahua to the highest summits of the Cordilleras, it ranges through nearly 5,000 feet of elevation. Attaining its fullest development in rich and watered cañons, it nevertheless mounts in smaller specimens to high and dry slopes and rocky ledges.

On the driest crests of ridges near the summits, where the soil was little more than disintegrated porphyry or granite, grew *Juniperus tetragona, Schlecht.*, branching at the base and sending up several bushy stems to the height of ten or twenty feet oftener than taking the form of a tree.

Even nearer the summits, but standing with other trees in better soil, I found the other Juniper, *J. occidentalis, var. conjugens*, previously mentioned as common on the summits of the dry ranges of the centre of the plateau. With Junipers so common and widely distributed over Mexico, it would seem that the supply of railroad ties need not be imported from far northern swamps at a cost of a dollar apiece.

Pseudotsuga Douglasii, Carr., the Douglas Spruce, as might be expected, was found in high cañons with a northern aspect, not exceeding here *Pinus Arizonica* in its dimensions, and with it *Abies concolor*, showing a diameter somewhat less.

Above these on the cool talus of cliffs were occasional belts of Aspen, *Populus tremuloides*, so familiar to northern eyes, here a slender tree only a few inches in diameter.

Quercus grisea, Leibm.—Nine-tenths of the Oaks of these mountains would seem to be of this species. It mingles with the long-leaved Pines on the plains at the base, it predominates over the Pines and all other trees on the foot-hills and benches, and it straggles after the Pines up the slopes to the very summits. Only in the cañons that are deepest and wettest does it yield place to other species.

In these *Quercus reticulata, HBK.*, reaches proportions gratifying to behold to one who, searching the Santa Rita mountains of Arizona for a specimen for the American Museum, saw but a single specimen worthy to be called a tree, that growing by a spring far up towards the summits, and only got down by great labor. All through these wet cañons and far up their sides, if it can have the shade of cliffs, this Oak habitually makes a tree of good size. Mounting the ridges, however, it diminishes in size in direct ratio to the amount of water in the soil, till on their arid crests it assumes the form of low bushes, and forms thickets of chapparal. It is my impression (I would like to see the test made), that the wood of this species most nearly of all Mexican Oaks approaches in quality that of our White Oak, *Q. alba*, and, if seasoned with due care, might be employed in carriage work.

Quercus hypoleuca, Engelm., also flourishing in the cañons, but spreading more commonly than the last over the cooler benches and slopes, makes a larger tree, one not rarely two or three feet in diameter. This is one of the most attractive of Oaks, in open situations showing a symmetrical outline with close evergreen foliage, deep green and glossy above, white or fulvous-tomentose beneath.

Quercus fulva, Leibm., appeared less frequent than the above species, and was only seen on the lower benches and ridges in warm exposures. It is but a small tree in its best development, seldom more than a foot in diameter and thirty in height. With its great leathery leaves it presents a striking appearance.

Arbutus Xalapensis, HBK., was found sparsely scattered over these mountains in a great variety of situations, and was seen on the ranges as far eastward as Chihuahua. Its diameter of one or two feet is disproportionate to its height. Of stooping habit, throwing out long tortuous branches without regard to symmetry, it assumes grotesque forms; and with its white bark, on the branches mostly smooth, its evergreen leaves and pink flowers, succeeded by scarlet berries, it is a tree of unique appearance.

Another *Madroña, Arbutus petiolaris, HBK.* (?) was not scarce, though confined entirely to the northern verge of ridges, and cool, dry soil formed of disintegrating porphyry. This tree is rather smaller than the last, but resembles it in appearance, except that its entire bark is smooth and reddish, and its leaves broader, serrate and pubescent.

There was a surprising paucity of shrubbery in these forests among the Oaks. I call to mind only *Ceanothus Fendleri, Gray, C. azureus, Desf., var.* (?) *parvifolius, Watson*, on rocky hills, *Arctostaphylos pungens, HBK.*, in dry situations with *Pinus cembroides*, and *Spiræa discolor, Pursh*, var. *dumosa, Watson*, about the ledges of the summits.

Charlotte, Vt. *C. G. Pringle.*

Correspondence.

The Mountain Laurel.

To the Editor of Garden and Forest:

Sir.—I have a desire to introduce the Mountain Laurel on a place about fifty miles south of the White Mountains, in New Hampshire, but have been told by skilled gardeners and others who have given particular attention to the subject, that it is practically impossible to transplant, or to propagate it from cuttings. I have planted the seed (a year ago), but, as yet, with no results. If any of your readers could give any hints or information on this subject, it would be much appreciated. *A. L. Dow.*

Brooklyn, N. Y., October 15th, 1888.

[The Mountain Laurel (*Kalmia latifolia*) is easily transplanted from the woods. Young plants, not more than eight to twelve inches high, should be selected for this purpose. They should be carefully dug during the latter part of September or in October, and if they are to be planted at a considerable distance from the place where they have grown, the roots should be enveloped at once in sphagnum moss and the plants packed in boxes or barrels. They will need protection during the first winter, and should be set thickly in the ground, in a cold-frame or cellar, or, if there is no opportunity to protect them in this way, they can be heeled in in some sheltered situation and carefully covered with leaves and evergreen branches. In the spring the plants should be set in nursery rows and cultivated during the season. In the spring of the third year they will be large and strong enough to bear transplanting into the positions they are to occupy permanently; after that the plants will require no further care or attention. The Laurel grows in almost all soils except those strongly impregnated with lime, but in cultivation it flourishes most freely in a well-drained compost of sandy loam and peat. The Laurel may also be raised from seed, but the young seedlings grow slowly and require special care, so that persons unfamiliar with the business and without special facilities for raising seedlings, are not recommended to adopt this method of obtaining plants. The Mountain Laurel is grown largely in some European nurseries, and fine bushy plants, a foot high and as much across the branches, covered with flower-buds, can be imported and delivered in this city or in Boston in quantity at about thirty cents a plant.—Ed.]

Gorse and Scotch Heather in New England.

To the Editor of Garden and Forest:

Sir.—Can you tell me whether the Furze, or Gorse (*Ulex Europæus*), will stand the winter on the coast of Massachusetts, in a rather exposed situation?

And will any of the Scotch Heathers live in such a situation? Will you give me the botanical names of such varieties? *F. E. G.*

[The Gorse was planted quite largely several years ago in Massachusetts, on the Island of Naushon, lying between the mouth of Buzzard's Bay and the Vineyard Sound, for the purpose of covering the ground and preventing the drifting of loose sand. It lived for a number of years, and plants may still be seen upon the island. It never spread much, however, and in severe winters always suffered. It cannot be considered hardy in New England, and its cultivation is not recommended, except as a garden-ornament in sheltered positions, or where it can be carefully covered and protected. The so-called Scotch Heather is *Calluna vulgaris*, a low, heath-like plant, with handsome purple flowers. It has been found growing spontaneously in one locality in Massachusetts, and it is not rare in Newfoundland and far northward on this continent. Its true home, however, is in northern Europe. Although a hardy plant, it cannot be recommended for planting in exposed situations on the New England sea-coast, as it often suffers in severe winters when not carefully protected. The plant which most resembles the Gorse, at least in flower, which is really available for planting on the New England sea-coast, is the European Woad-wax (*Genista tinctoria*), a low shrub of the Pea family, with bright yellow flowers. This plant now occupies many hundred acres of sterile, hilly land near Salem, in Essex County, Massachusetts, near the sea-coast. It spreads rapidly, and when once it has taken possession of the soil, no other plant can dislodge it. The appearance which these hills present when the Genista is in bloom is striking and beautiful, recalling more clearly to the mind a Gorse-covered moor of Europe than anything which can be seen elsewhere in the United States. The Genista, however, has proved itself a dangerous and persistent weed in Essex County, and there is always danger that it will, when planted, spread over and ruin valuable land. It is only beautiful while in flower, being quite insignificant during the remainder of the year. There are such a number of dwarf native shrubs with beautiful flowers, or with handsome foliage, which can be used for covering rough and exposed situations along our coast, that it does not appear necessary to look to foreign countries for plants for this purpose. Plantations made of our native Roses, the Bayberry, the dwarf Sumachs, the different Blueberries, the Beach Plum, the Hudsonias, the dwarf Cherry, the dwarf Viburnums, the Sweet Fern, are suitable and appropriate for the New England coast. Such plantations, made without the aid of human hands, may be seen in many places along the shores of Cape Cod and Cape Ann. Nature, with all the wealth of material at her disposal in more favored climates, has never made combinations more harmonious in color, or more suitable to their surroundings. They put on in autumn, too, after the beauty of the spring and the summer have vanished, a richness of color which gives to our coast scenery, at this season of the year, a character peculiarly its own, and so beautiful that the mere suggestion of introducing into the scene any foreign element which cannot heighten and must diminish this distinctive charm seems undesirable, to say the least.—Ed.]

To the Editor of Garden and Forest:

Sir.—I have been greatly annoyed by ants in the house, where they swarm through kitchen and pantries, and on the lawn, where they construct unsightly little mounds, and crawl over every one who dares to sit on the grass. What is the best defense against this invasion?

Lancaster, Pa. *E. M.*

[First find the ant-hills which harbor them. This is not difficult if sharp watch is made of the directions in which they travel. Professor Cook, of Michigan Agricultural College, then attacks them by sinking a crow-bar into the centre of the mound till it reaches the level of the lowest gallery in the ants' nest. Half a gill of bisulphide of carbon is then turned into the hole, and a shovelful of clay is at once thrown on and trodden down compactly. This holds in the poison fumes of the volatile liquid, and soon destroys the last ant. In the latest Bulletin of the Massachusetts Agricultural College the same advice, practically, is given by Professor Fernald. A large ant-hill, nearly six feet square, next to the underpinning of a house, was doing much damage. The ground was undermined so completely that a person walking over it would sink in quite deeply, and the grass on the hill was nearly dead. Holes were made with a small stick, about fifteen inches apart and six inches deep, and two or three teaspoonfuls of the bisulphide were thrown into each hole, after which the holes were closed and the earth pressed down by stepping on them. The treatment was successful. The closing up of the orifice seems to be essential. Bisulphide of carbon is a chemical preparation that can be found at any drug-store. It has a most disagreeable smell. The bottle in which it is contained should be kept tightly stopped, as it quickly loses its strength when exposed to the air. The fumes should not be breathed while using it, because

they are injurious as well as disagreeable. As it burns at a temperature of 107° Fahrenheit, it should be kept away from fire.—ED.]

Recent Publications.

Annual Report of the Division of Forestry, Department of Agriculture, for 1887: *B. E. Fernow, Washington, 1888.*

The Forestry Division of the Department of Agriculture was organized chiefly as a bureau of information, and the report before us, while giving an account of the methods by which this educational work has been carried on during the year, contains much besides that will afford instruction, provoke inquiry and stimulate interest. Like its predecessor, this report contains few statistics, for the good reason that the department has not at command the elaborate machinery needed to secure accurate figures. Some imperfect data in regard to the amount of forest planting in the West are given, and Mr. Fernow takes occasion to note that many reports of tree-planting in the prairie states are misleading exaggerations. Even when the number of trees planted is accurately given, they often include those set by the roadside and about dwellings for ornament and for shelter belts, as well as those in forest masses. But scattered trees can never make a forest, and it is unfair to divide the whole number of trees planted by the number required to the acre under the Timber Culture Act, and consider the result as the acreage of artificial forest. And even if the acreage planted under this act were correctly stated, we have no knowledge of the present condition of the trees, or what per cent. of them will be likely to live and thrive. Mr. Fernow rightly insists that we are using up our wood crop more rapidly than it reproduces itself. Those who doubt this swift reduction of our supplies because of our still abounding forest wealth and because it is true that in some parts of the country the wooded area is increasing on abandoned farm land, should remember that even where there is no absolute denudation the forest may deteriorate in quality, and that the new crop that is springing up on the old fields is quite inferior to the original growth.

This report deals mainly with a different class of subjects from those treated last year. The chief value of the last year's report was in the section which set forth the principles of forestry proper. The most interesting portion of the present report is that in which is outlined a system of study and original investigation with a view to place the practice of forestry in America on a rational basis. It is argued that if the Division of Forestry is to accomplish the most worthy results, it is time that it took a step in advance of its old work of compiling doubtful statistics, of recounting what has been done in the Old World, and of exhorting our people not to squander the forest wealth of the country. All of this was needed, perhaps; but what Mr. Fernow calls "missionary work" can safely be left to the public press and to the forestry associations of the different states. What is now needed is exact knowledge—such knowledge as can only be gained by careful experiment and study. It is to suggest the lines upon which such inquiry should proceed, and to make a proper co-ordination and subordination of the various fields of investigation that the topics have been grouped into systematic arrangement.

It may be that experience in studying and teaching will suggest some modification of this schedule, but as it stands it serves a good purpose in presenting to readers, who have not given serious and continued thought to the matter, an adequate conception of the wide range of subjects to which the American student of forestry can profitably direct his attention. And very plainly it would be to the general advantage if the Department of Forestry, the agricultural colleges, the experiment stations and private investigators should devote themselves, according to their several lights and abilities, to researches of the kind here indicated. It is true that forests have been and will be successfully planted and managed, and forest crops profitably harvested by men who know little, in a scientific way, of the life history of the trees they plant and fell, and still less of the general distribution of our forest flora or of the technological properties of different woods. It is equally true that there have been entire generations of fairly successful farmers who have had little or no exact knowledge of the sciences which underlie the practice of agriculture. But no one will contend that our agriculture has not been improved materially in recent years by the published results of scientific research. Farmers now talk intelligently of nutritive ratios and of the proper proportions of nitrogen, potash and phosphoric acid in their fertilizers, and it is this knowledge which makes our agriculture progressive and full of promise. It is not too early to begin the systematic study of forestry with the same purpose. It will be years, indeed, before the same care will be given to the production of forest crops here that is used in some countries of Europe. Our time for strictly scientific forestry has not yet arrived. But years will be required before we shall be able to collect the facts and experience we shall need, when the refinements of forestry, with its close calculations and intensive methods, can be practiced to advantage.

To this exposition of a plan of comprehensive study, Mr. Fernow adds some suggestive paragraphs on experimentation in the forest, the nursery and the laboratory, together with observations meteorological and climatic. The successful practice of the future must be based upon methodical experiments conducted persistently by men of scientific training. In no other way can data be furnished that will enable us to answer with confidence such elementary questions as: What is the best time to thin? At what period of growth can the forest crop be most profitably utilized? How do the financial results of natural reforestation and artificial planting compare? Mr. Fernow indicates the lines which these investigations are to follow, and illustrates, by examples, the kind of knowledge that is to be gained in this way. The entire section is most valuable as affording popular instruction upon points to which general attention has not been directed.

The report also contains a brief summary of the condition of the forests in the several states, notes on a few timber trees, certain bulletins which the division has issued during the year and much miscellaneous matter. Altogether, it admirably accomplishes its purpose to disseminate information, and it cannot fail to instruct the class of readers which it will reach and give them a clearer conception of the importance of the problems in forestry which now confront the country and of the proper means to employ if they are to be satisfactorily solved.

Recent Plant Portraits.

PTEROCARYA FRAXINIFOLIA, *Gardeners' Chronicle*, October 6th; a hardy tree belonging to the Walnut family, bearing in long, graceful racemes small hard nuts with broad, membranous wings. The finest specimen of this tree in the United States is believed to be in the Harvard Botanic Garden in Cambridge. There is a second species, a native of Japan, *P. stenoptera*, now sometimes cultivated, and of very considerable promise as an ornamental tree.

JUGLANS MANDSHURICA, *Gardeners' Chronicle*, October 6th; a hardy Walnut from Amurland, closely related to the North American Butternut (*J. cineria*). This interesting species has been an inhabitant of the Arnold Arboretum for a number of years, ripening large crops of fruit there every year. It is a tree of compact and handsome habit, of considerable ornamental value, and the nuts are of a sufficiently good quality to make it quite possible that this species may in time become of value as a fruit tree in the Northern States, and in other regions where the English Walnut cannot be grown successfully.

PSEUDOPHŒNIX SARGENTI, *Gardeners' Chronicle*, October 13th.

LILIUM NEPALENSE, *Gardeners' Chronicle*, October 13th; a handsome Lily from the Central Himalayas, requiring greenhouse cultivation. The flowers are described as greenish on the outside, with the interior of the perianth an intense red-crimson color, with light greenish tips.

Notes.

The Chrysanthemum Show of the Massachusetts Horticultural Society will be held in Boston on 14th, 15th and 16th of November.

No less than 150 species of Primrose, divided into sixteen sections, are recognized by the German botanist, Pax, in his recent monograph of this genus.

The Forestry Congress in Atlanta will meet on December 5th, and not, as previously announced, on November 29th, which is Thanksgiving Day. The Southern Passenger Association, which embraces all the railroads south of the Potomac, and, on this occasion, the Pennsylvania system, so far as New York, has arranged for round-trip tickets to the great National Exposition in Augusta, Georgia, at one fare, and will grant stop-over tickets to attend the Forestry Congress in Atlanta. As the northern and southern societies will be consolidated in Atlanta, a large delegation is expected on December 5th. Full particulars can be had by addressing Mr. Sidney Root, Atlanta.

In the rich prairie soil of the Kansas Agricultural Experiment Station, where fertilizers and yard manure proved of little value, an application of salt at the rate of 300 pounds to the acre, increased the yield of wheat perceptibly.

Mr. T. S. Brandegee has discovered this summer *Pinus Torreyana* growing upon Santa Rosa, one of the small group of islands which lie off the Californian Coast in the latitude nearly of Santa Cruz. The discovery is an interesting one, as *Pinus Torreyana* has been considered one of the rarest and most local of American trees, being known formerly only in one very restricted locality in the neighborhood of San Diego, California.

Great baskets of the Fringed Gentian, the loveliest of all our late autumn wild flowers, appear this year in Boston in the hands of street flower-sellers. It would be difficult to conceive anything more beautiful than the dark blue of this delicate flower when thus seen in great masses. Very attractive, too, are bunches of the bright-colored fruit of the Roxbury Waxwork (*Celastrus scandens*), surrounded with Kalmia leaves, which appear just now very popular with people who purchase flowers in the streets of Boston. Every few minutes a woman may be seen with one of these bunches on her dress or in her hand.

The tropical plants which have filled the two large vases in front of the City Hall, in Boston, have been replaced with Chrysanthemums in full bloom. The effect is excellent. The decorative value of the Chrysanthemum is only just beginning to be appreciated in this country, and they will grow in popularity as they become better understood. They can certainly be used with great advantage in this way, and if early flowering varieties, to be followed by those which bloom later, are selected for the purpose, there is no reason why vases and many garden beds, especially in cities, cannot be made attractive for at least six weeks after the frost has destroyed the beauty of more tender plants.

The gelatine which is contained in the "edible birds'-nests" of the Orient, and which, of course, is what constitutes their nutritive quality, was once supposed to be a secretion from the salivary glands of the bird itself—a species of swift. But it has been proved to be a Sea-weed, which the bird often brings from long distances. Mr. J. B. Steere, writing recently in the *American Naturalist*, describes a visit which he paid under the guidance of professional nest-hunters to the caves where these birds build in the Philippine Islands. They build in utter darkness, and it takes about a month to complete a nest. This the hunter must secure before the eggs are laid, otherwise it would naturally be unavailable for culinary purposes.

A correspondent of the *Revue Horticole*, writing from Nancy, speaks enthusiastically of the new race of hybrid Gladioli obtained in the famous horticultural establishment of Monsieur Lemoine, by crossing *G. Saundersi* with the so-called Lemoine Hybrids, obtained by mingling the blood of *G. aureo-purpuratus* with some of the varieties of *G. Gandavensis*. The shape, size and the markings of the flowers of this new race are said to be marvelous and to display a beauty heretofore unknown among Gladioli. It is probable that one or two of these varieties will appear in the new edition of the Lemoine catalogue and will be offered for sale. Some of the seedling Montbretias, raised in the same establishment, are said to show great improvement in the form and in the color of the flowers.

The general introduction into commerce of lumber manufactured from the Gum-tree or Tupelo (*Nyssa sylvatica*) is hindered by the practice of some dealers of attaching false names to it, with the idea of disguising its real character. In England it is sometimes called Satin Walnut in the trade; in this city it can be found under the name of Hazel-wood; and it has appeared as Arkansas Redwood. Gum is a valuable wood when its peculiarities of excessive shrinking and warping are guarded against by proper methods of manufacturing and seasoning, but it gains nothing by having false and misleading names attached to it. And in the same way Sycamore lumber is just as valuable when it is called Sycamore as when it is called Satin-wood, as is sometimes the case in eastern markets.

Colonel Pearson states, in the *Philadelphia Weekly Press*, that the cost of treating an acre of Grape vines with the copper sulphate solution, which has proved efficacious against both the black rot and the mildew, need not exceed, for labor and material, ten dollars. The solution which he uses is known as the Bordeaux mixture of copper sulphate and lime, the formula for which was given in the issue of Garden and Forest for September 19th. This mixture is a whitish liquid resembling somewhat thin milk of lime, and the precipitate should be constantly stirred as the vines are sprayed through a Cyclone nozzle. The first application should be made before the vine-buds open in the spring, and in seasons favorable to the growth of the rot fungus, it should be repeated every three weeks. For a certain protection against the rot, every cluster and every berry must be reached by the spray, and this can be easily accomplished with the machinery now at command.

Early grafting of the Cherry in the open air is always recommended, and dormant buds are considered necessary in grafting under cover. The advice is well founded, but the true reason for it is rarely given. If the stock is as forward in growth as the scion, a union of the two can be made quite late in the season. The essential requisite is that the wood of both should be in the same condition. In a late bulletin of the Iowa College Experiment Station, Professor Budd cites an instance where it became necessary late in April to take up several valuable Cherry-trees loaded with fruit buds. All the scions were cut off down to the two-year-old wood, and set on Mazzard seedling roots in the graft-room. The grafts were put in the nursery a few days later, and over ninety per cent. of them made strong growth. In this case the buds were started, on one variety, so as to exhibit the points of the embryo leaves, yet the roots taken from the cellar had started fully as much. If the seedling had been kept dormant in the ice-house, probably not a single scion would have united with them. This principle applies to all top-working in the open air of Apple, Pear, Cherry, Plum, etc. If the work is deferred until the buds on the stocks are well started, the scions should be about equally advanced.

In 1883 Professor Budd imported one-year-old Cherry trees of such varieties as he considered promising for the northwest, from the valley of the Moselle, in eastern France, and eastward to the Volga, in Russia. The trees have, so far, proved as hardy as our native Plums, and many of them fruited heavily this year. The fruit is satisfactory in quality and color, but not in size. The smallness of the fruit may have been due to the strong growth of new wood, induced by severe cutting for scions in autumn. In a late bulletin Professor Budd recommends that these trees be headed low, and adds that, even in western Europe, low cordon and bush training of the Cherry is becoming common. In eastern Europe, in sections remote from large bodies of water, all stone fruit trees are headed low. In the Volga region the Cherry is grown in bush form, with several stems like the Currant or Gooseberry. Experience has also favored very low stems, or even bush form, in all the prairie states. Often the stems are fatally injured when the twigs show no discoloration. Fortunately, many of the east Europe varieties favor the shading of stems by their pendent habit of growth. But even with these it is best to have low stems, the lower the better.

A hundred years have passed since the Botanic Garden at Calcutta was established, and Dr. George King, the superintendent, joins to his last annual report an interesting historical sketch of this famous institution. It was founded by the East India Company, upon the recommendation of one of its servants, Colonel Robert Kyd, who became the first superintendent, holding the position until his death in 1793. Among his successors appear the names of many distinguished botanists, of whom the best known are Roxburgh, the author of the earliest Flora of India; Wallich, whose three volumes upon some rare Indian plants are among the most sumptuous in botanical literature, and Dr. Thomas Thompson, the coworker with Sir Joseph Hooker in Indian botany. The garden has been of immense service in making known and distributing Indian plants and in the introduction of useful plants, like the Tea and the Cinchona, into Indian cultivation. The garden was devastated by a terrible cyclone in 1864, and a second cyclone, a few years later, almost ruined the few plants which had escaped the first. A troublesome weed, *Imperata cylindrica*, then spread rapidly over the ground of the whole garden, which had become exposed to the sunlight by the destruction of the trees, and when Dr. King was appointed superintendent in 1871, it was in a miserable condition. He has, however, entirely replanted the garden with reference to landscape effect and erected new conservatories and a new building for the immense herbarium, principally of Asiatic plants, which is connected with the garden, and which is constantly enriched with new collections. It is said that of the trees which were growing in the garden in 1867, the great Banyan tree is the only one now left standing.